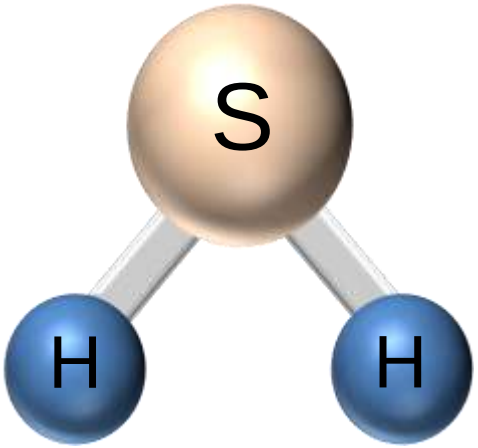
DELAWARE TOXICS RELEASE INVENTORY

2012



HYDROGEN SULFIDE
(H_2S) MOLECULE

DATA SUMMARY

Prepared by the
Department of Natural Resources and Environmental Control
Division of Waste and Hazardous Substances

December 2013

2012 TRI DATA SUMMARY

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Front Cover: *The cover is an image of a hydrogen sulfide molecule. In 2012, hydrogen sulfide was added to the list of reportable TRI chemicals. In the first year of reporting, hydrogen sulfide accounted for 82% of all on-site management activities for TRI chemicals reported by TRI facilities in Delaware.*

A Message from DNREC Secretary Collin O'Mara

The 2012 Toxics Release Inventory (TRI) reporting year for Delaware was marked with significant progress in reducing air emissions, but some significant increases resulting from facilities restarting and the addition of hydrogen sulfide being added to TRI reporting requirements for the first time. The addition of hydrogen sulfide alone accounted for 78 percent of all reported TRI waste activities in 2012. This represents new data available to the public, but does not necessarily reflect new chemical activities. Of the 329 million pounds of hydrogen sulfide reported for 2012, 99.98 percent was treated onsite. The majority of hydrogen sulfide is reported as treated by the Delaware City refinery, where it is converted to elemental sulfur, which is then sold for agricultural and chemical manufacturing uses.

While interest in TRI data has typically been focused on the reported amounts of chemicals released directly to the environment, data for additional categories such as waste treatment and recycling are important to consider as well. Facility efforts to collect and transform waste into useful products should be recognized along with efforts to reduce releases. Of all the TRI waste reported for 2012, less than 2 percent was reported as released onsite to Delaware's air, water, or land. Over 98 percent was reported as either treated on- or offsite by various means (recycling, energy recovery, treatment, or being sent to a publicly owned treatment works).

The 2012 reporting year also marked a complete year of the Delaware City refinery returning to full operations. Overall onsite releases for all facilities for 2012 increased by 32 percent compared to 2011. While 2% of this increase was due to the addition of hydrogen sulfide, the rest was primarily due to the refinery returning to full production.

Overall releases increased compared to 2011, when the refinery was not in full production. However, as compared to the last full year of production, 2008, onsite releases from all TRI facilities are down 45 percent. There also have been some very noteworthy reductions in TRI data. The efforts of power plants and the implementation of Regulation 1146 have resulted in significant reductions in releases, specifically in releases to air. Releases to air decreased by more than 54 percent, or 1.3 million pounds, compared to 2011. The Indian River Generating Station accounted for the vast majority of the decrease, reducing their releases of hydrochloric acid to air by 1.3 million pounds from 2011 and decreasing by a total of 2.1 million pounds over the past two reporting years.

As this year has included significant changes and new data, I encourage people to utilize this TRI annual report and the additional resources available through the Emergency Planning and Community Right-to-Know Act to become familiar with the chemical activities occurring in their community.

Sincerely,

Collin P. O'Mara, Secretary,
Department of Natural Resources and Environmental Control

INTRODUCTION

Chemicals are a part of our lives. We use chemicals in our homes, our cars, our schools, and our industries. Chemicals are used to make many things, including electricity, fuel, and consumer products, which we use, enjoy, and depend on each day.

Delaware citizens and all Americans also have a right to air that is clean, water that is safe to drink, food that is free from dangerous contaminants, and communities that are free of hazardous wastes.

In 1986, Congress created the Toxics Release Inventory (TRI) under Title III, Section 313, under the Superfund Amendments and Reauthorization Act (SARA). Title III, also known as the Emergency Planning and Community Right to Know Act (EPCRA), was established to ensure that toxic chemicals and their wastes are managed and used safely and responsibly by the manufacturing industries and other facilities, and to let the communities in which these facilities are located, know about the releases, disposals, and waste management of these chemicals.

Recognizing the value of information and the power the public can apply through the use of the "Right-to-Know" concept, Delaware and DNREC joined with the EPA to report on releases and other waste management of toxic chemicals reported through TRI.

This report provides a summary of the release and waste management of toxic chemicals by Delaware facilities in 2012. DNREC also publishes a second, more detailed TRI report that provides information about each TRI chemical reported by each facility in Delaware.

TRI facilities reported an increase of 1,267,000 pounds (32%) in the total amount of state-wide on-site releases for 2012. Off-site waste management activities increased 12%. On-site waste management, not including releases, was higher by 619%, due to the addition of hydrogen sulfide to the list of reportable chemicals. Over 329 million pounds of hydrogen sulfide was treated on-site, primarily by the Delaware City Refinery. This information does not represent new activity, but new data that is available to the public.

In 2012, the Delaware City Refinery was in full operation for a complete year. The refinery increased its on-site releases by 2.5 million pounds. This increase returned on-site releases to levels similar prior to refinery beginning the shutdown process to be sold.

The on-site release trend for persistent bioaccumulative toxins (PBTs) was down by 1,100 pounds or 9%, and down 60% since 2001. The trend for cancer-causing chemicals (carcinogens) was up by 11,000 pounds, or 6%, for 2012, but down 77% since 1998.

We hope that, with the help of industry and interested citizens, reductions in the amounts of on-site releases of TRI chemicals will continue.

Delaware's Department of Natural Resources and Environmental Control (DNREC) hopes that the information presented in this report will benefit Delaware citizens by improving their awareness and promoting their involvement in environmental issues in their communities.

WHAT IS THE TOXICS RELEASE INVENTORY?

The **Toxics Release Inventory**, or **TRI**, is a collection of data that contains information about toxic chemicals that are manufactured or used by some, but definitely not all, facilities in the United States. See the next page for details on who must report to the TRI program. This information is reported each year by the facilities to the states where they are located and to the U.S. Environmental Protection Agency (EPA). This information is made available to the public through this report and a more technical report published by Delaware's Department of Natural Resources and Environmental Control (DNREC). In addition, the EPA publishes TRI reports, and the data is available through state and federal internet sites. The TRI program was established in 1986 to provide information to the public about the presence and release of toxic chemicals in their communities. It is part of the Emergency Planning and Community Right-to-Know Act (EPCRA).

The EPCRA Reporting Programs at EPA and DNREC maintain databases that are updated as new reports are received. The databases currently contain 26 years of data. Most chemical releases reported under TRI are also regulated through Federal and/or State permits.

This report is a summary of the 2012 TRI data and revisions received as of October 1, 2013 from Delaware facilities.

WHY IS THERE A NEED FOR THIS PROGRAM?

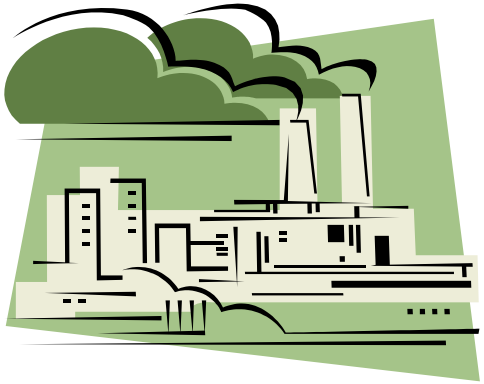
A dramatic and fatal accident involving the release of a large quantity of methyl isocyanate gas occurred in Bhopal, India on December 3, 1984. Because of this release and similar, less tragic, accidents that occurred in the United States, Congress enacted the Emergency Planning and Community Right to Know Act (EPCRA). The purpose of this Act is to give citizens information about the chemicals present in their communities, and to improve the ability of facilities and local emergency agencies to plan for and respond to chemical emergencies. The Act established a number of reporting requirements for facilities and businesses, and reporting began in 1987. In 1991, Delaware established its own EPCRA legislation that enhanced the federal requirements.

WHAT IS A TOXIC CHEMICAL?

A toxic chemical is one that meets any one of several standards for serious or significant potential to harm human, fish, or animal life, or to be harmful to the environment. There are now 597 chemicals and an additional 30 chemical categories, such as mercury compounds, polycyclic aromatic compounds (PAC's), and Dioxin and Dioxin-like compounds, on the TRI chemical list. Of these chemicals and compounds, 88 were reported by 60 facilities in Delaware for 2012.

WHO MUST REPORT TO THE TRI PROGRAM?

Not every facility in Delaware reports to the TRI program. There are three requirements a facility must meet before reporting is required.



1. Only facilities that have 10 or more full time employees are required to report.
2. A facility must be doing business as a manufacturer or processor, generate electric power, or distribute bulk petroleum products. All federal facilities are also required to report.
3. A facility must manufacture or process one of the chemicals on the TRI list in quantities greater than a minimum threshold value.

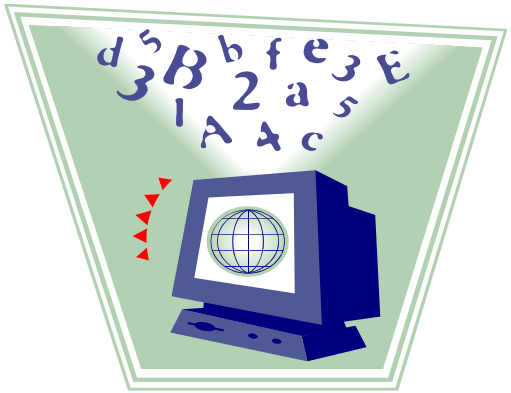
This threshold value is generally 25,000 pounds for Manufacturing and Processing, and 10,000 pounds for the Otherwise Use category. There are lower threshold values (see Table 2 on page 8) for Persistent Bioaccumulative Toxins (PBTs).

Facilities submit chemical reports through one of two forms, Form R or short Form A. If certain requirements are met, some facilities are able submit on the short Form A, which contains no amounts for the reported waste management activities.

HOW DO WE GET THE DATA?

Each year by July 1, facilities report on each chemical that meets the reporting threshold. Each chemical report is usually on a 5-page form that details the type and amount of on-site release, off-site transfer, or on-site waste management activity the chemical has experienced during the prior calendar year. The facilities report this data to DNREC and to the EPA.

DNREC and EPA check the data for completeness and accuracy, including comparing it with data

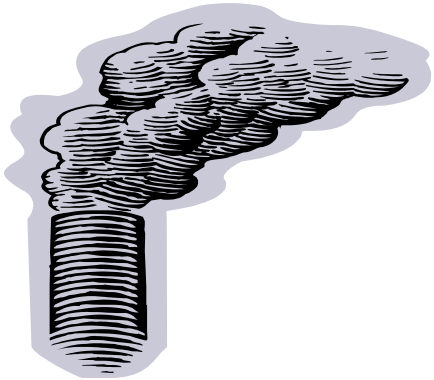


reported to other programs.

DNREC also visits some of the facilities to get a better understanding about the process at the facility and the reasons for specific chemical use. In addition, DNREC and EPA may audit a facility if they suspect that reporting was not accurate. Both DNREC and the EPA publish reports on the data. TRI data and reports, such as this one, are available to the public.

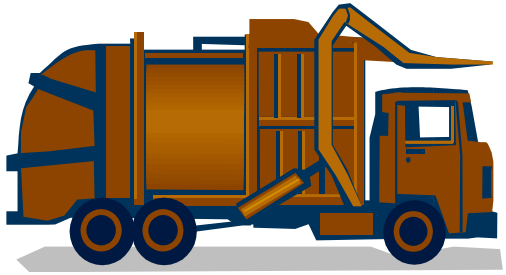
TYPES OF TRI DATA

TRI chemical data is reported in several categories. Table 1 on the next page lists all the categories and amounts reported to the TRI program for 2012.



<u>On-Site Releases</u>: On-site releases in Delaware are to **air, water,** or **land**. **Releases to air** include stack releases (air released via stacks, vents and pipes) and fugitive releases (air escaping from leaking valves or vapors from tanks). **Releases to water** are releases to streams or water bodies, including rivers, lakes, oceans and bays at the facility site. This includes releases from sources such as industrial process outflow or open trenches and storm water runoff. **Releases to land** go to landfills, surface impoundments (uncovered holding areas used to evaporate and/or settle waste materials), other land disposal such as waste piles or releases, and land application or treatment in which waste containing a TRI chemical is applied to or incorporated into soil or land at the facility.

<u>Off-Site Transfers</u>: Off-site



transfers include transfer of chemical waste to **POTW's** (Publicly Owned Wastewater Treatment Plants), to **recycle** operations, to **energy recovery** operations, to **treatment** operations, and for **disposal.** These transfers are to other facilities that are permitted to accept the waste from the facility that generates it.

<u>On-site waste Management:</u>
Waste management activities at the facilities include **recycling,**

energy recovery, and treatment. These are the same as described above in Off-Site Transfers, but these activities occur on-site.

2012 DATA SUMMARY

Table 1 shows statewide totals of 2012 reported TRI on-site releases, off-site transfers, and wastes managed on-site. These different categories are discussed in the previous section and below.

Sixty facilities submitted 235 reports on 88 different chemicals. Reports from all Delaware facilities showed an overall increase in the total amount of state-wide on-site releases by 1,267,000 pounds (32%) for 2012. These facilities also reported an increase of 344 million pounds (619%) in on-site waste management amounts, and an increase of 1,602,000 pounds (12%) in transfers off-site for disposal or treatment.

Hydrogen sulfide was added the list of reportable chemicals for 2012 and accounted for 78% of all TRI waste management activities. Hydrogen sulfide accounted for the single largest waste management activity, with over 329 million pounds being treated on-site by the Delaware City Refinery. The addition of hydrogen sulfide represents new data that is available and not necessarily new activity.

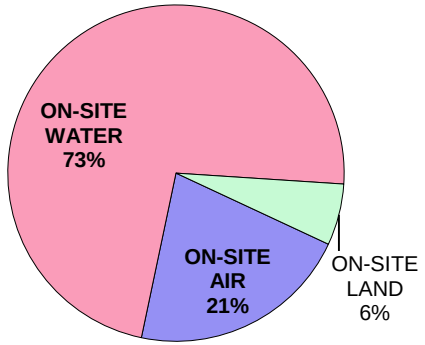
TABLE 1
2012 TRI DATA SUMMARY
(IN POUNDS)

	2012
No. of Facilities	60
No of Form As	33
No of Form Rs	202
No. of Chemicals	88
On-Site Releases	
Air	1,109,211
Water	3,777,904
Land	306,702
Total On-Site Releases	5,193,817
Off-Site Transfers	
POTWs	814,006
Recycle	9,383,706
Energy Recovery	2,556,954
Treatment	196,890
Disposal	2,419,683
Total Off-Site Transfers	15,371,238
On-Site Waste Mgmt.	
Recycle	8,183,213
Energy Recovery	16,227,012
Treatment	376,022,549
Total On-Site Mgmt.	400,432,774
Total Waste	420,997,829

ON-SITE RELEASES

On-site releases are emissions to the air, water, or land environment at the facility site. Figure 1 shows the relative amounts of all TRI chemicals released on-site for all Delaware TRI facilities. Releases to water make up the largest portion (73% for 2012) of the total on-site release amount. The percentage released to water increased for 2012 because releases of nitrate compounds to water increased by 2.5 million pounds.

FIGURE 1
2012 ON-SITE RELEASES



TOTAL REPORTED

5,193,817 POUNDS

On-site releases to air were down 1,308,000 pounds or 54% compared to 2011. The largest reduction was the hydrochloric acid released to air by the Indian River generating Station dropping by 1,330,000 pounds.

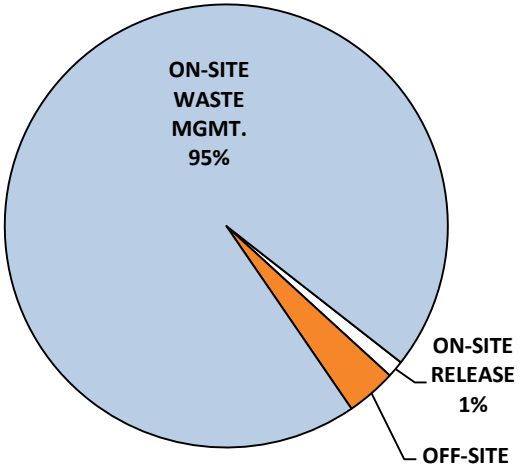
Releases to **water** accounted for 73% of all on-site releases, with 99% being nitrate compounds released to water primarily from the Delaware City Refinery and Perdue Georgetown facilities. Although these facilities are large producers of nitrate compounds, there are several other nitrate-producing facilities in Delaware that are not subject to the TRI program.

On-site releases to **land** are mostly metallic compounds such as barium, vanadium, lead, nickel, manganese, chromium, copper, and zinc compounds. The Indian River Power Plant and Evraz Claymont Steel (ECS) generate most of these compounds from impurities in fuels (Indian River) and metals (ECS) that they process.

TOTAL WASTE

The relative amounts of all TRI chemical wastes from the three main categories in Table 1 are shown in Figure 2, where you can see the percentage contribution of the on-site releases, off-site transfers, and on-site waste management.

FIGURE 2
2012 TOTAL TRI WASTE



TOTAL REPORTED: 420,997,829 POUNDS

Table 1 and Figure 2 show that on-site releases make up only about 1% of the total TRI waste. Other data, including transfers off-site and waste managed on-site are discussed in more detail in the *2012 TRI Data Detail Report* available from DNREC.

LIMITATIONS OF TRI DATA

In addition to the fact that not all facilities in Delaware are required to report to the TRI program, there is an important thing to keep in mind:

THIS DATA DOES NOT INDICATE THE AMOUNT, IF ANY, OF HUMAN EXPOSURE OR HOW SEVERE IT MIGHT BE.

TRI data does not provide an indication of actual or potential exposure to the reported releases and cannot be used by itself to determine the impact on your health. Other factors such as the chemical's release rate, the toxicity of the chemical, where the chemical enters the environment, the direction of its path and its proximity to nearby communities must be fully considered when assessing exposure to the chemical. For example, a small release to air of a highly toxic chemical near a community may be a greater risk than a large release to land of a less toxic chemical in a remote area.

PERSISTENT, BIOACCUMULATIVE TOXIC CHEMICALS

In 2000, the EPA began requiring reporting at much lower threshold levels on a class of chemicals known as persistent, bioaccumulative, toxics (PBTs). Table 2 shows the new thresholds. In 2001, lead and lead compounds, already on the TRI chemical list,

were added to the PBT list, and their reporting thresholds were also reduced.

PBTs are receiving increased attention because we are learning that these chemicals are more toxic to humans, animals, and the environment than others. They remain in the environment for a long time and may not be readily destroyed by nature. PBTs may also move up the food chain and accumulate in bodies of humans, fish, and animals rather than being destroyed or eliminated.

Because of the increased hazards associated with these substances, the thresholds for reporting PBTs to TRI are much lower than the basic thresholds applied to other, non-PBT substances. If these PBT chemicals are manufactured, processed, or otherwise used above the reporting threshold amounts shown in Table 2, rather than the amounts on page 4, they are reportable to the TRI program. The total amounts released on-site for these PBT substances are shown in Table 3 on the next page.

TABLE 2
2012 PBT CHEMICALS
AND REPORTING THRESHOLDS
(pounds/year)

Chemical or Chemical Category	Threshold (Pounds)	2012 REPORTS
Aldrin	100	0
Benzo[g,h,i]perylene	10	3
Chlordane	10	0
Dioxin and dioxin-like compounds category	0.1 grams	6
Heptachlor	10	0
Hexachlorobenzene	10	1
Isodrin	10	0
Lead *	100	2
Lead and lead compounds *	100	11
Mercury	10	2
Mercury compounds	10	6
Methoxychlor	100	0
Octachlorostyrene	10	1
Pendimethalin	100	0
Pentachlorobenzene	10	1
Polychlorinated biphenyls (PCBs)	10	1
Polycyclic aromatic compounds category (PA	100	8
Tetrabromobisphenol A	100	0
Toxaphene	10	0
Trifluralin	100	0
* Lower Threshold For 2001 Reports	TOTAL	42

TABLE 3
2012 TRI PBT DATA SUMMARY
(IN POUNDS)

	PBTs only 2007	PBTs only 2008	PBTs only 2009	PBTs only 2010	PBTs only 2011	PBTs only 2012
No. of Facilities	30	27	25	26	26	21
No. of Form A's	4	NA	NA	NA	NA	NA
No. of Form R's	59	60	54	49	48	42
No. of Chemicals	11	11	11	11	11	11
On-Site Releases						
Air	4,172	3,716	1,568	1,768	2,253	1,333
Water	1,565	1,008	492	1,143	132	70
Land	15,270	28,948	18,052	6,039	11,212	11,062
On-Site Releases	21,008	33,673	20,112	8,949	13,596	12,466
Off-Site Transfers						
POTW's	5	4	2	5	8	1
Recycle	3,127,560	3,322,811	3,500,383	2,659,278	2,968,631	4,102,492
Energy Recovery	0	55	55	0	0	0
Treatment	9	0	0	0	0	0
Disposal	113,753	58,847	59,069	45,758	19,558	29,517
Total Transfers	3,241,328	3,381,717	3,559,509	2,705,041	2,988,197	4,132,010
On-Site Waste Mgmt.						
Recycle	3	3	3	3	280	1,385
Energy Recovery	0	0	0	0	0	0
Treatment	858	873	736	202	570	864
Total On-Site Mgmt.	861	876	739	205	850	2,249
Total PBT Waste	3,263,196	3,416,266	3,580,360	2,714,195	3,002,643	4,146,725

Table 3 shows the reported on-site releases and other waste management activities amounts for PBTs for 2007-2012. The PBT chemicals made up a small part, about 0.24%, of the total TRI on-site releases for 2012. Lead and lead compounds make up a large portion, 11,251 pounds, or 90%, of PBT on-site releases for 2012. Releases from coal-burning operations at power generating facilities accounted for 10,449 pounds of this amount. The 2012 reported on-site releases of PBTs are 1,130 pounds (8%) lower compared to 2011 because of a large decrease (1,004 pounds) in the amount of lead compounds released to air by the Dover Air Force Base.

Evraz Claymont Steel had the largest PBT release to air, 351 pounds and the largest PBT release to water, 40 pounds, both releases being lead compounds. The Indian River Power Plant had the largest PBT release to land, 10,367 pounds which was also lead compounds.

Over 96% of the PBT amount transferred off-site for recycle was lead compounds from Johnson Controls Battery Plant and Distribution Center. V&S Galvanizing reported the highest amount of on-site PBT chemical waste management with 813 pounds of lead being recycled on-site.

DIOXINS

Chemicals vary in toxicity, and dioxins are the most highly toxic class of PBTs. Because of their high toxicity, dioxins are reported in grams rather than pounds under TRI. One gram equals 0.0022 pounds. The dioxin trend for Delaware is shown in Figure 3 on the next page. The DuPont Edge Moor facility made a major process change and reduction in on-site releases starting in 2003; its reported 2002 on-site release was 13.85 grams (and higher for previous years) but its 2012 amount was only 1.17 grams. Evraz Claymont Steel began reporting on dioxins in 2006, resulting in the upward trend in Figure 3.

Table 4 shows the amounts reported released on-site by the facilities that reported on dioxins. The total amount reported for 2012 was 12.49 grams, down from the 18.03 grams reported for 2002. Evraz Claymont Steel, the top reporter in Delaware for on-site release of dioxins for 2012, reported 7.07 grams, or 0.01559 pounds.

Beginning with reporting year 2008, additional information on toxicity became available to TRI for dioxin and dioxin-like compounds (DLCs). The 17 compounds that fall under the category of DLCs reportable to TRI have a wide range of toxicity; the toxicity value is called the Toxic Equivalent Factor (TEF). In order to compare the releases on an equal toxicity basis, we multiply the TEF of each dioxin by the weight reported to get the Toxic Equivalent Quantity (TEQ). The rank of facilities may change when comparing weight or TEQ amounts.

Please see the 2012 TRI Detail Report for a more technical discussion of TEQ. The discussion includes comparisons based on weight and TEQ amounts for each facility reporting dioxins.

FIGURE 3
DELAWARE DIOXIN TREND
ON-SITE RELEASES

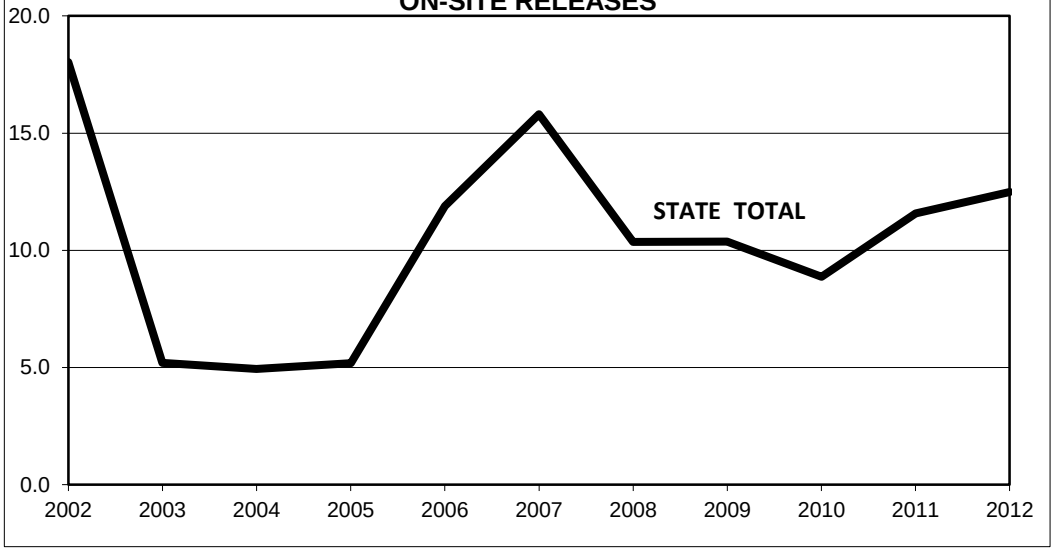


TABLE 4
FACILITIES SORTED BY DIOXIN ON-SITE RELEASE

FACILITY	TOTAL ON-SITE GMS. RELEASE	ON-SITE GMS. RANK
EVRAZ CLAYMONT STEEL	7.07	1
EDGE MOOR/HAY ROAD POWER PLANTS	3.55	2
DUPONT EDGE MOOR	1.17	3
DELAWARE CITY REFINERY	0.56	4
INDIAN RIVER POWER PLANT	0.13	5
FORMOSA PLASTICS	0.01	6
TOTAL	12.49	

Mercury and Mercury Compounds

Mercury (elemental mercury) and mercury compounds are an important part of the PBT category, and this section discusses some of the data. Control of mercury and mercury compounds is becoming increasingly important as we learn more about the serious side effects of mercury.

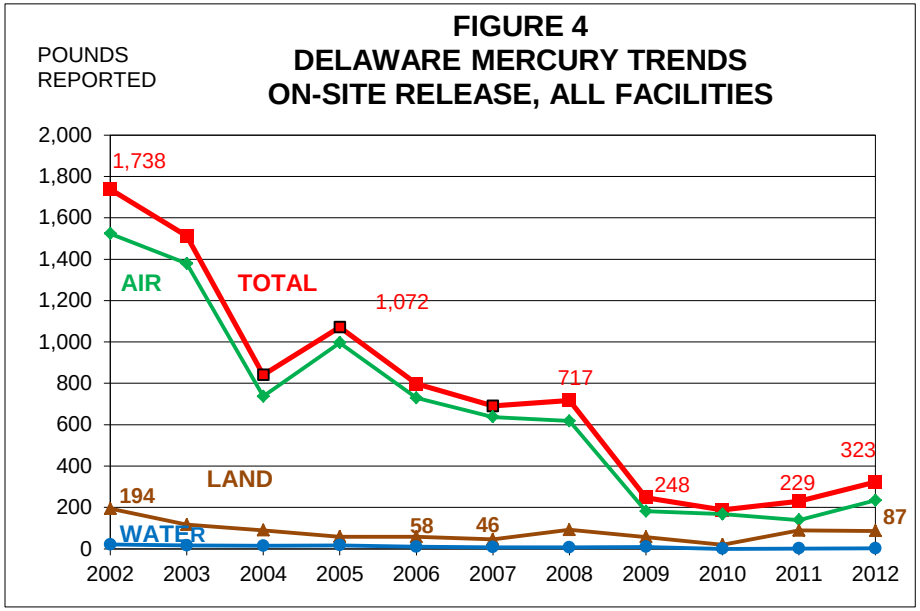
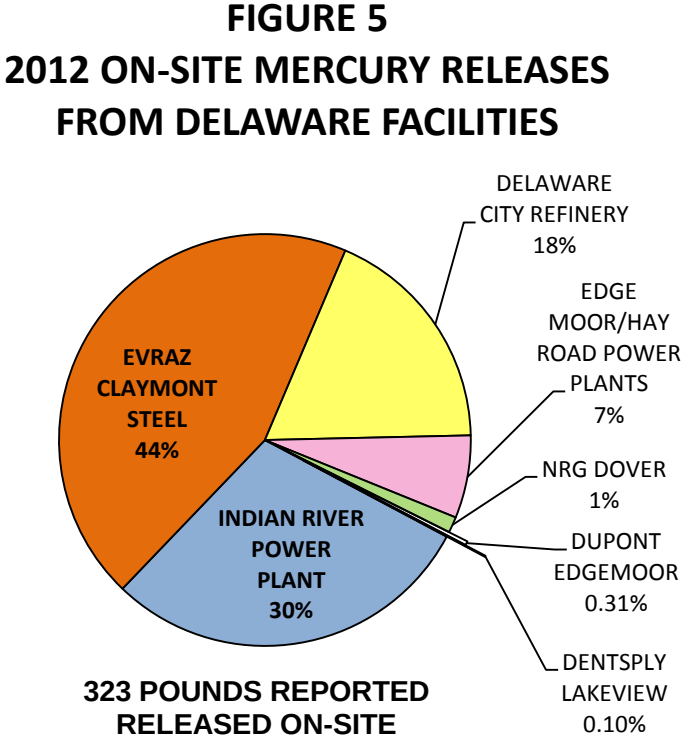


Figure 4 shows the trend since 2002. Total reported on-site releases of mercury in Delaware have decreased by 81% since the peak of 1,738 pounds in 2002. Reported total mercury and mercury compound on-site release amounts increased by 94 pounds (41%) compared to 2011. Evraz Claymont Steel led the changes with an increase of 60 pounds, Delaware City Refinery was second with an increase of 36 pounds, and the Indian River Power plant reported a decrease of 3 pounds. The reasons for the changes are a combination of changing mercury content of materials used, such as coal or metals, changes in production, changes in estimating emissions, and better pollution controls.

Figure 5 shows the percentage that each of the facilities that reported a mercury or mercury compound contributed to the mercury on-site release for 2012.



CARCINOGENIC CHEMICALS

Some chemicals are known to or suspected to cause cancer in humans. These chemicals are called carcinogens. Table 5 shows the 29 chemicals on the TRI list that are identified as carcinogens and were reported in Delaware for 2012. Table 5 also shows the number of reports (66) that were received by Delaware for each of these chemicals.

DATA FOR CARCINOGENIC CHEMICALS

Table 6 shows data for carcinogens reported to TRI in Delaware since 2006. The trend has been generally down from the 381,972 pounds reported for 2006, but recent increases were reported by Formosa Plastics for vinyl acetate (17,231 pounds) and benzene (4,975 pounds) from the Delaware City Refinery, both released to air. Additional detail can be found in the longer, more technical *2012 TRI Data Detail Report* available from DNREC. The amount of carcinogens released on-site in 2012 has increased by 6% compared to the amount released in 2011 and has decreased 48% since 2006.

TABLE 6

2006-2012 TRI CARCINOGENS

ON-SITE RELEASES IN POUNDS

	2006	2007	2008	2009	2010	2011	2012
AIR	187,836	145,637	161,821	128,593	142,210	167,047	179,417
WATER	6,770	8,094	5,627	2,586	1,761	1,468	199
LAND	187,366	78,238	140,976	51,417	14,862	18,572	18,476
TOTAL ON-SITE	381,972	231,970	308,424	182,596	158,832	187,087	198,092

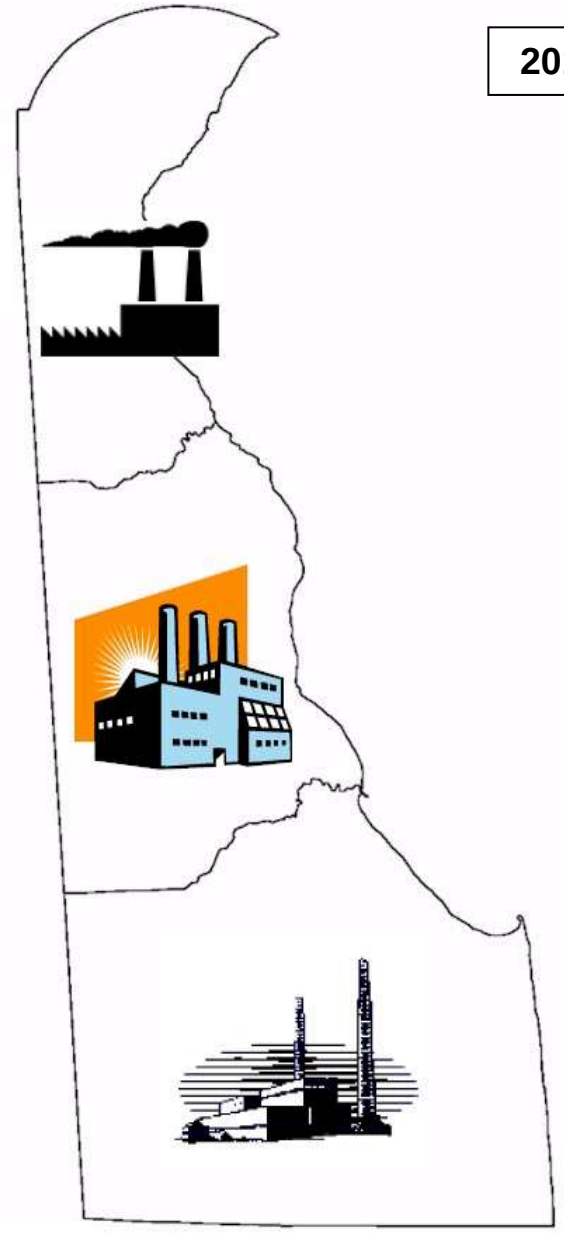
TABLE 5
CARCINOGENS REPORTED BY DELAWARE FACILITIES FOR 2012

CHEMICAL NAME	IARC	NO. OF REPORTS
4,4'-METHYLENEBIS(2-CHLOROANILINE)	1	2
ARSENIC COMPOUNDS	1	1
ASBESTOS (FRIABLE)	1	1
BENZENE	1	1
CHROMIUM COMPOUNDS	1	4
ETHYLENE OXIDE	1	1
NICKEL COMPOUNDS	1	4
VINYL CHLORIDE	1	1
1,3-BUTADIENE	2A	1
CREOSOTE	2A	1
LEAD	2A	2
LEAD COMPOUNDS	2A	11
POLYCHLORINATED BIPHENYLS	2A	1
TRICHLOROETHYLENE	2A	1
COBALT COMPOUNDS	2B	1
DICHLOROMETHANE	2B	1
ETHYL ACRYLATE	2B	1
ETHYLBENZENE	2B	3
HEXACHLOROBENZENE	2B	1
NAPHTHALENE	2B	5
NICKEL	2B	3
NITROBENZENE	2B	1
P-CHLOROANILINE	2B	1
POLYCYCLIC AROMATIC COMPOUNDS	2B	8
PROPYLENE OXIDE	2B	1
STYRENE	2B	3
TETRACHLOROETHYLENE	2B	1
TOLUENE DIISOCYANATE (MIXED ISOMERS)	2B	3
VINYL ACETATE	2B	1
CHEMICALS = **29**	REPORTS = **66**	

Source: 2012 DNREC TRI Database, October 2013

FIGURE 6

2012 ON-SITE RELEASES BY COUNTY



NEW CASTLE

Releases to Air = 701,670 Pounds
Releases to Water = 3,416,565 Pounds
Releases to Land = 21,925 Pounds
Total On-Site Releases = 4,140,159 Pounds
148 Reports, 30 Facilities
79.7% of Statewide Releases

KENT

Releases to Air = 85,021 Pounds
Releases to Water = 0 Pounds
Releases to Land = 0 Pounds
Total On-Site Releases = 85,021 Pounds
34 Reports, 13 Facilities
1.6% of Statewide Releases

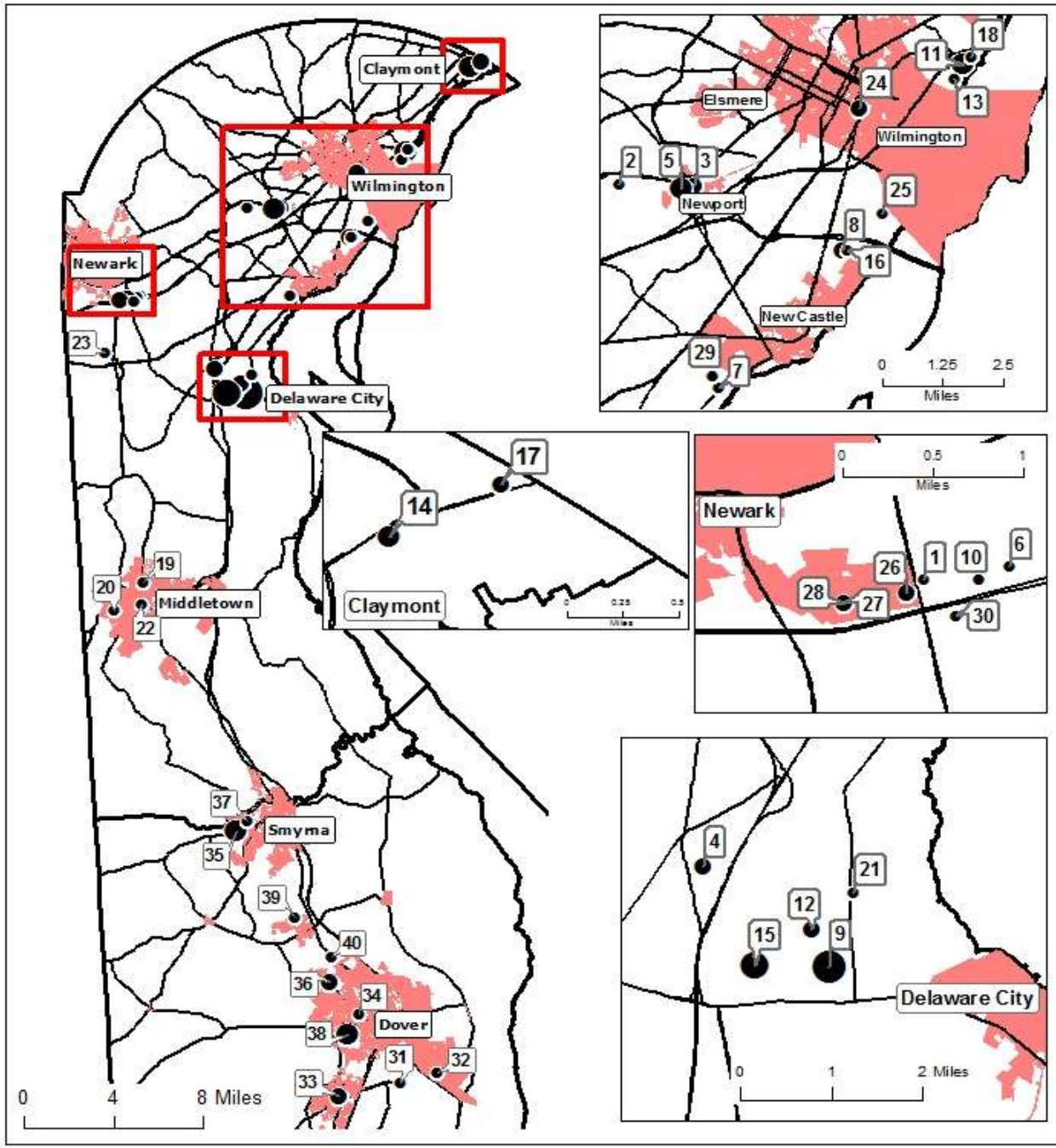
SUSSEX

Releases to Air = 322,519 Pounds
Releases to Water = 361,339 Pounds
Releases to Land = 285,152 Pounds
Total On-Site Releases = 969,009 Pounds
53 Reports, 17 Facilities
18.7% of Statewide Releases

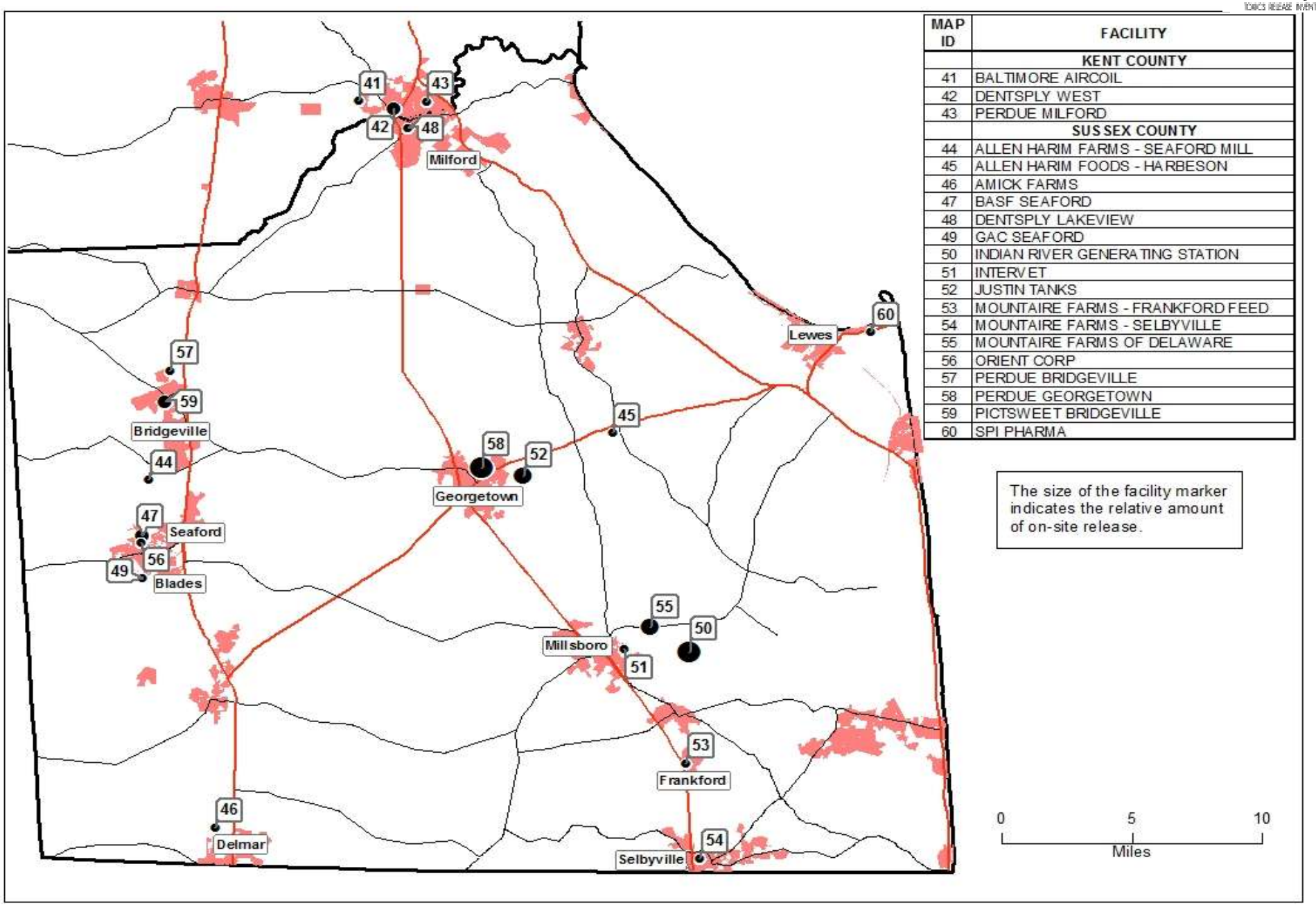
Figure 6 on this page summarizes data about the TRI releases in 2012 for each county, and the maps and indexes on the next 2 pages show where TRI facilities are located.

Source: DNREC 2012 TRI Database, 10-1-13

FIGURE 7 - TRI FACILITY LOCATOR MAP 2012



MAP ID	FACILITY
	NEW CASTLE COUNTY
1	AEARO TECHNOLOGIES
2	AGILENT TECHNOLOGIES NEWPORT
3	AIR LIQUIDE - MEDAL
4	ARLON
5	BASF NEWPORT
6	CHROME DEPOSIT
7	COLOR WORKS
8	CRODA
9	DELAWARE CITY REFINERY
10	DUHADAWY TOOL AND DIE
11	DUPONT EDGE MOOR
12	DUPONT RED LION PLANT
13	EDGE MOOR/HAY ROAD ENERGY CENTERS
14	EVRAZ CLAYMONT STEEL
15	FORMOSA PLASTICS
16	FUJIFILM
17	HONEYWELL
18	IKO
19	JOHNSON CONTROLS BATTERY PLANT
20	JOHNSON CONTROLS DIST. CENTER
21	KUEHNE
22	MACDERMID
23	MOTECH AMERICAS
24	NORAMCO
25	PRINCE MINERALS
26	ROHM & HAAS B2,B3,B8
27	ROHM & HAAS B5, B6
28	ROHM & HAAS B7,B15
29	V&S DELAWARE GALVANIZING
30	VP RACING FUELS
	KENT COUNTY
31	CARL KING
32	DOVER AFB
33	HANDY TUBE
34	HANESBRANDS
35	HANOVER FOODS
36	HIRSH INDUSTRIES
37	METAL MASTERS
38	NRG DOVER
39	PPG DOVER
40	SERVICE ENERGY DOVER

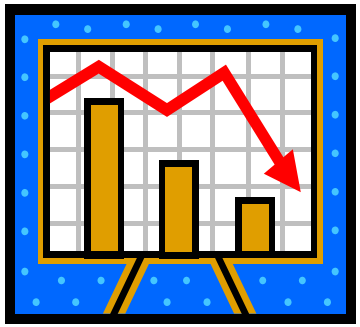


MAP ID	FACILITY
	KENT COUNTY
41	BALTIMORE AIRCOIL
42	DENTSPLY WEST
43	PERDUE MILFORD
	SUSSEX COUNTY
44	ALLEN HARIM FARMS - SEAFORD MILL
45	ALLEN HARIM FOODS - HARBESON
46	AMICK FARMS
47	BASF SEAFORD
48	DENTSPLY LAKEVIEW
49	GAC SEAFORD
50	INDIAN RIVER GENERATING STATION
51	INTERVET
52	JUSTIN TANKS
53	MOUNTAIRE FARMS - FRANKFORD FEED
54	MOUNTAIRE FARMS - SELBYVILLE
55	MOUNTAIRE FARMS OF DELAWARE
56	ORIENT CORP
57	PERDUE BRIDGEVILLE
58	PERDUE GEORGETOWN
59	PICTSWEET BRIDGEVILLE
60	SPI PHARMA

The size of the facility marker indicates the relative amount of on-site release.

FIGURE 7 - TRI FACILITY LOCATOR MAP 2012

TRENDS OVER TIME



In addition to the reported releases for the latest year, DNREC also looks at how the releases change over time. If a type of release is trending up or down, we will look for reasons why. It may be because a group of chemicals, such as PBTs or carcinogens, had a change in reporting requirements, or the economy changed demand for products that a facility produces. Whatever the reason, we look at trends as long-term indicators for the way activity is changing. We also look at trends for potential issues that need investigation.

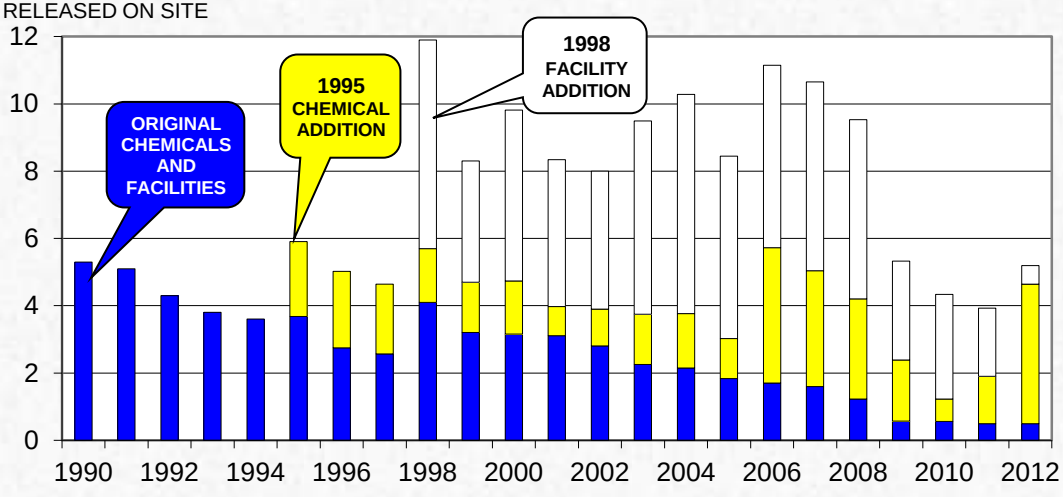
The EPA adds chemicals and facilities to the TRI program when it discovers chemicals that are significant toxics, or that some facilities as a group tend to manufacture or use toxic chemicals. Figure 8 shows the trend of the on-site releases since 1990, and also shows the result of adding chemicals and facilities, and industry efforts to reduce releases. Usually a few chemicals are added or deleted every year and they are included in the totals for that year.

Since 1990, on-site releases of the original chemicals from the original facilities in the TRI program list have trended down over time and are now 91% (4.8 million pounds) lower than the original amount reported.

In 1995, a large group of chemicals was added increasing the total number of chemicals to 667 from the 365 reportable in 1994. This group increased by 195% or 2.74 million pounds compared to 2011, due to the increase in releases of nitrate compounds. Excluding nitrate compounds, the group has decreased by 0.52 million pounds or 58% since 1995.

In 1998, an important group of facilities was added. This group

FIGURE 8
EFFECT OF CHEMICAL AND FACILITY GROUP ADDITIONS
1990-2012



Source: DNREC 2012 TRI Database, 10-1-13

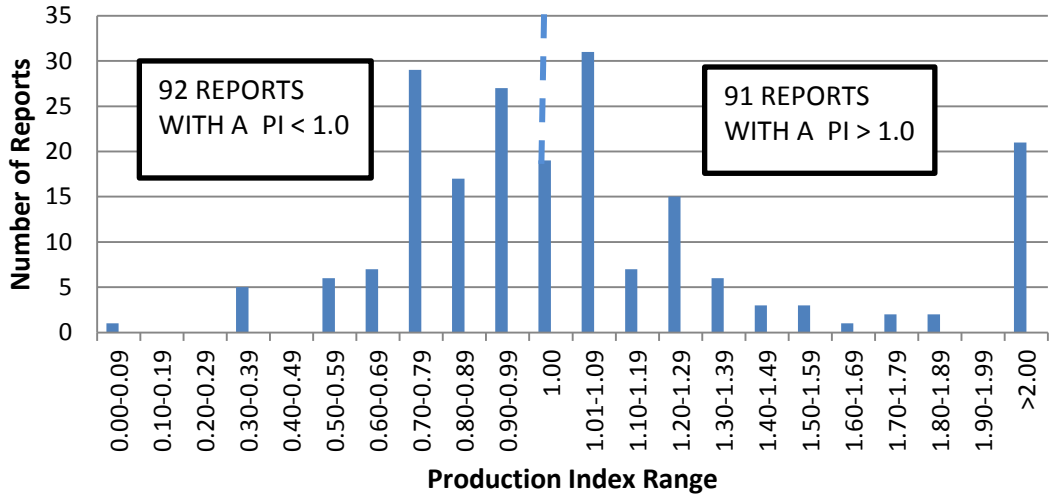
included the electric generating facilities that use coal or oil as fuel, as well as some chemical and petroleum distribution facilities. The Indian River Power Plant and the Edge Moor/Hay Road Power Plants are significant facilities in this group. Because the electric generating facilities are starting to implement parts of the new Delaware Electric Generating Unit Multi-Pollutant Regulation, the 1998 Facility Addition group is now 91% (5,650,000 pounds) lower than its original reported amount for 1998.

If each group had remained constant at its original reported amount, the amounts reported for 2012 would be 13.73 million pounds instead of the 5.19 million pounds reported; a reduction of 8.54 million pounds, or 62%.

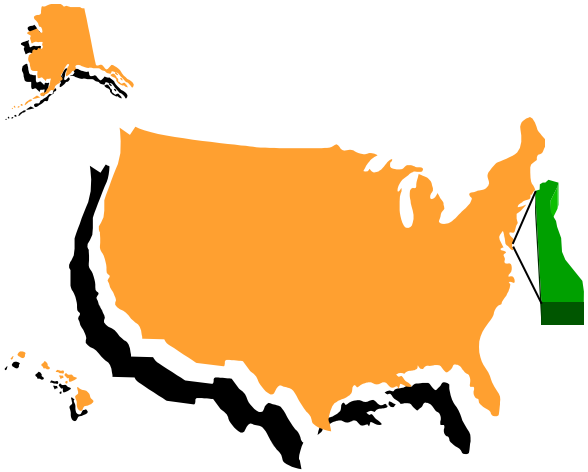
TRI AND THE ECONOMY

A Production Index (PI) is reported along with TRI release and waste management data. This index is one way to estimate the impact of the economy, because the PI is the level of production associated with the chemical being reported. PI is reported as a number, representing the ratio of how production increased or decreased compared to the previous year. For example, a facility reporting an increase of 10% would report the PI as 1.10, while a facility reporting a decrease of 10%, would report the production as 90% of the previous year or a PI of 0.90. A facility having the same production level as the previous year would report the PI as 1.0. The average PI reported was 1.37 or a 37% increase compared to 2011's production level. Figure 9, shows the distribution of the PIs reported for 2012.

Figure 9:
2012 Production Index Distribution



NATIONAL PERSPECTIVE



It may be helpful to see how Delaware compares to other states and to the nation.

At the time of this report, the EPA had released its preliminary national 2012 TRI data, so we compared our 2012 data and the following are some highlights from this comparison:

1. Delaware ranks 45th in the nation for total on-site releases.

2. Over 100 facilities in the nation each individually released more on-site than all the facilities in the State of Delaware combined.

3. Delaware released 0.14% of the total on-site release amounts in the nation.

4. Some reports from nearby facilities in neighboring states exceed the amounts for all Delaware reports for a specific chemical. For example, one facility in Pennsylvania released 365,600 pounds of sulfuric acid to air. The Delaware total for all facilities was 166,817 pounds. Another facility in Maryland released 255,000 pounds of n-hexane to air. The Delaware total for n-hexane was 27,349 pounds.

Some facilities in Delaware do rank at or near the top of the national rankings for specific releases.

DuPont Edge Moor ranks #14 for on-site release of carbonyl sulfide and ranks #8 in the on-site treatment of hydrochloric acid.

Formosa Plastics ranks #2 for on-site release of vinyl chloride and #4 for on-site release of vinyl acetate.

Rohm& Hass B2,B3,B8 ranks #1 in the on-site recycle of n-n-dimethylformamide.

Delaware City Refinery ranks #11 for on-site release of nitrate compounds. The refinery also ranks #2 in the on-site treatment of hydrogen sulfide, #1 in the on-site treatment of carbonyl sulfide and #3 in the on-site energy recovery of ammonia.

No Delaware facility ranked in the top 100 facilities for on-site release of mercury.

Delaware ranks #42 within the states for on-site release of mercury and mercury compounds for 2012.

OTHER SOURCES OF INFORMATION

Information about TRI and related programs is available from several additional sources. Some of these sources are shown below. Other sources can be found in our DNREC *2012 TRI Data Detail Report.*

Access to the DNREC TRI Files - DNREC is responsible for collecting, processing, and distributing information that was submitted by Delaware facilities under the TRI program. The 1998-2012 TRI annual reports may be viewed through the DNREC link at: http://www.dnrec.delaware.gov/SERC/Pages/Reports.aspx. Additional details and information not in the reports are available to the public through the EPCRA Reporting Program located within DNREC. A searchable database is the Data Search link at: dnrec.delaware.gov/SERC/Information/Pages/DataSearch.aspx

Toxics Release Inventory National analysis - EPA's annual TRI report. It covers 2012 information nationwide and provides a good perspective on how Delaware and the companies in Delaware compare to other states http://www2.epa.gov/toxics-release-inventory-tri-program/2011-tri-national-analysis The 2011 report is available now and the 2012 edition of this report will be available later this year.

Delaware's Department of Natural Resources and Environmental Control has publications, reports, and information available for a wide variety of programs at: http://www.dnrec.delaware.gov/info/pages/ELibrary.aspx.

Environmental Databases are available at: http://www.dnrec.delaware.gov/Info/Pages/GISData.aspx.

Notifications of releases in Delaware can be found at: Delaware Environmental Release Notification System (DERNS).

Other Delaware EPCRA Information- In addition to TRI reports, there are other provisions of the Emergency Planning and Community Right to Know Act (EPCRA) that provide information to the public and to local emergency planning and response organizations. For additional information, visit the Delaware EPCRA website at: http://www.serc.delaware.gov/epcra.shtml.

EPA's TRI Home Page – The EPA TRI home page provides information on the many facets of the TRI program at EPA, including an Executive Summary, Q&A's, a link now to the 2010 TRI data, and later this year to the 2011 data, a current list of reportable chemicals, reporting forms, state and federal program contacts, and various guidance documents available for downloading. This website has many links to other EPA and non-EPA sites associated with TRI. www.epa.gov/tri/.

Right-to-know Network - Searchable nationwide TRI data is available through RTKNet. The RTKNet was established by two non-profit organizations to provide access to TRI and chemical data, link TRI with other environmental data, and exchange information among public interest groups. www.rtknet.org.

Delaware Public Health Cancer Rates and Causes – This site provides data and answers to many cancer-related questions. http://dhss.delaware.gov/dhss/dph/dpc/cancer.html

OTHER SOURCES OF INFORMATION

Chemical Data Fact Sheets - A two-page fact sheet is available for most TRI chemicals reported in Delaware and contains information on chemical characteristics, health hazards, and ecological effects. The two-page fact sheets (ToxFAQs) are available upon request from DNREC's TRI program or available through the Agency for Toxic Substances and Disease Registry at: http://www.atsdr.cdc.gov/toxfaqs/index.asp

Envirofacts Electronic Warehouse - Envirofacts is an EPA-developed website that provides public access to multiple environmental databases, including TRI. Links are available to data about hazardous waste, water permits, drinking water, Superfund sites, air, water, toxics, and more. On-line queries allow the user to retrieve data and create reports, as well as generate maps: www.epa.gov/enviro.

Delaware Air Quality Report - The annual air quality report is prepared by the Air Surveillance Branch in the Air Quality Management Section of DNREC. This report presents data gathered from a statewide network of air monitoring stations, and includes analyses, trends, and other information regarding Delaware's air quality. For a copy of the report, or for more information, please call (302) 323-4542. Annual reports are available on-line at: http://www.awm.delaware.gov/AQM/Pages/AQMPublicationsandReports.aspx and air toxics information is at: http://www.awm.delaware.gov/AQM/Pages/DATAS1.aspx.

The EPA site for additional air quality information is: http://www.epa.gov/oar/oaqps/publicat.html.

The Office of Pollution Prevention & Toxics (OPPT) - http://www.epa.gov/oppt/index.htm is a part of the EPA that:

- Promotes pollution prevention as the guiding principle for controlling industrial pollution;
- Promotes safer chemicals through a combination of regulatory and voluntary efforts;
- Promotes risk reduction so as to minimize exposure to existing substances such as lead, asbestos, dioxin, and polychlorinated biphenyls; and,
- Promotes public understanding of risks by providing understandable, accessible and complete information on chemical risks to the broadest audience possible.

Risk-Screening Environmental Indicators (RSEI) - This model was developed by EPA's Office of Pollution Prevention & Toxics as a risk-screening tool that provides a relative comparison of TRI releases. This application is available on CD-ROM or through the Internet at: http://www.epa.gov/oppt/rsei/.

Questions or Comments About This Report – Please direct your comments, questions, or requests to the TRI COORDINATOR at the location on the back cover of this report.

Delaware
Toxics Release Inventory

Delaware Department of Natural Resources and Environmental Control

Emergency Planning and Community Right to Know Program
655 South Bay Road, Suite 5N
Dover, Delaware 19901
302-739-9405

The Department of Natural Resources and Environmental Control is committed to affirmative action, equal opportunity, and the diversity of its workforce.

Doc. No. 40-04-04/13/10/02